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Photo Vignette

Firm papules on the penis and scrotum

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Abstract

An 18-year-old man presented with a 6-year history of penile and scrotal papules. Biopsy of one of the 1-3mm papules revealed calcinosis cutis.

Case synopsis

A healthy 18-year-old man presented with an approximately 6-year history (since 7th grade) of penile and scrotal papules. He reported the number and size of lesions had increased over time culminating in approximately thirty. The patient denied trauma, associated symptoms, or any prior treatments. Physical exam revealed multiple 1-3mm firm, white papules on the dorsal shaft of his circumcised penis and his scrotum (Figure 1). With verbal consent a 3 mm excisional shave biopsy was obtained under local anesthesia and fixed in formalin without complications. Macroscopically, the biopsy specimen was hard and brittle. The histopathologic findings are shown in Figure 2.



Figure 1. Whitish 1-3mm papules on penis



Figure 2. Basophilic calcium deposits in dermis

Microscopic examination revealed a normal epidermis. Basophilic staining calcium deposits in the dermis were apparent on hematoxylin and eosin stain. Surrounding inflammation and fibrosis were absent. No cystic structures were appreciated. The diagnosis was calcinosis cutis. The patient's serum calcium, alkaline phosphatase, and creatinine levels were within normal limits. Serum phosphorous, vitamin D, and parathyroid hormone levels were not obtained. During two follow-up visits the remaining lesions were excised with no recurrences to date. Mild residual hyperpigmented scarring remains at the excision sites.

Discussion

Calcinosis cutis denotes the deposition of insoluble calcium salts in cutaneous tissue and is divided into five subtypes based on the proposed etiologies: dystrophic (results from local tissue damage in the setting of normal calcium and phosphorous levels), metastatic (occurs in the situation of abnormal calcium or phosphorous levels, which predispose to calcium deposition), iatrogenic (observed as a therapy induced side effect), calciphylaxis (presents with calcification of small dermal and subcutaneous vessels), and idiopathic (characterized by the absence of tissue injury or metabolic derangement) [1]. Whereas this classification serves as a guide, it can be argued that there is often overlap; for instance, iatrogenic calcinosis cutis is dystrophic by definition. This observation may merit an alternative classification system for dermatopathologists such as the one suggested by Fernandez-Flores [2].

Genital tropism of calcinosis cutis, particularly of the scrotum, has been well chronicled in the literature [3,4]. However, involvement of the penis is significantly less common. In dialysis patients with end stage renal disease and secondary hyperparathyroidism, penile shaft vessel calcification has been attributed to the metastatic mechanism [5]. Further, several other cases have been ascribed to a dystrophic or iatrogenic pathogenesis [3,6,7].

Idiopathic calcinosis cutis of the penis was first described by Hutchinson *et al.* [8] and has subsequently been reported in an additional 11 men (including this patient) ranging in age from 10 to 29 years [7]. All previous patients presented for medical evaluation within a year [7]. However, the current patient waited approximately six years before evaluation. Characteristically, idiopathic penile calcinosis presents as an asymptomatic, firm, flesh colored papule or nodule that increases in size with time on the shaft or prepuce. Over half of the patients were uncircumcised and exhibited multiple lesions [7]. Excision serves a twofold role: it facilitates diagnostic confirmation via histology and provides definitive treatment. Microscopically, basophilic calcium collections in the dermis are observed on hematoxylin and eosin staining. Von Kossa staining may be used for confirmation and

periodic acid-Schiff, alcian blue, and immunoperoxidase staining (AE1/AE3; DAKO monoclonal antibody) may be employed to exclude adnexa and cytokeratin [6,7,8,9]. Fibrotic reactions and inflammation comprised of histiocytes, giant cells, and lymphocytic infiltrates surrounding these calcium aggregates were common histopathological findings, but were not universal [7].

Evidence in cases of scrotal calcinosis has suggested the underlying pathogenesis may involve dystrophic calcification of epidermal inclusion cysts or eccrine duct milia followed by obliteration of these structures, leaving behind the calcific contents [4,10]. Although a similar mechanism is plausible to explain idiopathic penile calcinosis, the complete absence of keratin on immunologic stains refutes this theory. The actual etiology is not understood.

In conclusion, idiopathic calcinosis cutis of the penis is a rare, asymptomatic, and benign condition predominantly affecting young men. One to multiple lesions may be present. Biopsy confirms the diagnosis and serves as definitive therapy. Dermal calcium aggregates are appreciated microscopically, typically with associated inflammation. Normal serum calcium, phosphorous, and parathyroid hormone levels support an idiopathic mechanism. Patients should be reassured there is no association with sexually transmitted diseases.

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